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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/561,288

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EXAMINER

ROE, JESSEE RANDALL

ART UNIT

PAPER NUMBER

1793

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PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/561,288	Applicant(s) ECKERT ET AL.	
	Examiner Jessee Roe	Art Unit 1793	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 17 August 2009.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-11 is/are pending in the application.
- 4a) Of the above claim(s) 4 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3 and 5-11 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|---|---|
| 1) <input type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Status of the Claims

Claims 1-11 are pending wherein claims 1-9 are amended, claims 10-11 are new, and claim 4 is withdrawn from consideration.

Status of Previous Rejections

The previous rejection of claims 1-3 and 5-9 under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention is withdrawn in view of the Applicant's amendment to claim 1.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-3 and 5-11 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

With respect to the recitation "introducing an amount of hydrogen into the molded object at a concentration below that at which an increase in brittleness of the molded

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object is observed above an original plastic deformability present before introduction of said amount of hydrogen” in claim 1, the specification does not provide support for this phrase.

With respect to the recitation “wherein said metallic glass is substantially free of beryllium” in claims 10-11, the Examiner notes that the specification does not provide support for this recitation.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-3 and 5-11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Suh et al. (The effects of hydrogen on viscoelastic relaxation in Zr-Ti-Ni-Cu-Be bulk metallic glasses: implications for hydrogen embrittlement).

In regards to claims 1-3 and 6-9, Suh et al. discloses a $\text{Zr}_{41.25}\text{Ti}_{13.75}\text{Ni}_{10}\text{Cu}_{12.5}\text{Be}_{22.5}$ molded into a glass plate wherein hydrogen is introduced into the plate without the formation of brittle hydrides by cathodic charging in a 1 N sulfuric acid aqueous solution with a constant current density of 20 mA/cm^2 wherein no temperature increase is associated with the Joule heating (i.e. room temperature, 25°C) (2. Experimental Procedure and 4.3 Implications for hydrogen embrittlement). Suh et al. further discloses that the plates are thin ($\sim 0.3 \text{ mm}$) to ensure uniform

distribution of hydrogen through the thickness. Suh et al. discloses that the hydrogen content of the $\text{Zr}_{41.25}\text{Ti}_{13.75}\text{Ni}_{10}\text{Cu}_{12.5}\text{Be}_{22.5}$ alloy is within the range of ~100 to 3000 ppm (2. Experimental Procedure), which overlaps the instantly claimed ranges of 20 to 1500 ppm (claim 6), 20 to 1000 ppm (claim 7), 20 to 800 ppm (claim 8), and 20 to 650 ppm (claim 9). Therefore, the introduction of "an amount of hydrogen into the molded object at a concentration below that at which an increase in brittleness of the molded object is observed above an original plastic deformability present before introduction of said amount of hydrogen" would be expected since substantially the same amount of hydrogen is being introduced into the same alloy.

The Examiner notes that the hydrogen content in the alloy disclosed by Suh et al. overlaps the hydrogen content of the alloy of the instant invention, which is prima facie evidence of obviousness. MPEP 2144.05 I. It would have been obvious to one of ordinary skill in the art at the time the invention was made to have selected the claimed amount of hydrogen from the amount disclosed by Suh et al. because Suh et al. discloses the same utility throughout the disclosed range.

With respect to the recitation "wherein the molded object comprises hydrogen which is distributed homogeneously in an amorphous short-range order structure and ductile alloying components are present in the amorphous short-range order and/or in the form of hydrogen-induced local accumulations of ductile alloying components and/or in the form of hydrogen precipitation of ductile, nanocrystalline phases with exclusion of brittle phases" in claim 5, the Examiner notes that Suh et al. discloses inducing hydrogen into a zirconium base alloy in a substantially similar manner as that of the

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instant invention. Therefore, hydrogen which is distributed homogeneously in an amorphous short-range order structure and ductile alloying components are present in the amorphous short-range order and/or in the form of hydrogen-induced local accumulations of ductile alloying components and/or in the form of hydrogen precipitation of ductile, nanocrystalline phases with exclusion of brittle phases would be expected. MPEP 2112.01 I.

With respect to the recitation “wherein said metallic glass is substantially free of beryllium” in claims 10-11, the Examiner notes that Suh et al. discloses a $\text{Zr}_{41.25}\text{Ti}_{13.75}\text{Ni}_{10}\text{Cu}_{12.5}\text{Be}_{22.5}$ alloy wherein there would be 22.5 moles of beryllium (which would be about 3.4 weight percent). Since the instant specification does not define “substantially free” as being less than 3.5 weight percent, Suh et al. meets the claim.

Response to Arguments

Applicant's arguments filed 17 August 2009 have been fully considered but they are not persuasive.

The Applicant primarily argues that one of ordinary skill in the art, seeking a metallic glass material with improved plastic properties would not incorporate hydrogen, since it was, at the time of the invention, well known that an increase in the brittleness of the material would be expected from such a procedure and the processing method of the instant invention leads to increase in ductility and, with that, to an increase in the plastic deformability of the material.

In response, the Examiner notes that Suh et al. teaches that the plastic deformation rate is strongly dependent on the available free volume (pg. 548, right column) and an increase in free volume is found after charging (in sulfuric acid) (pg. 549, right column). Therefore, it would be expected that the zirconium-titanium alloy of Suh et al. would have an improved plastic deformability.

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jessee Roe whose telephone number is (571)272-5938.

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The examiner can normally be reached on Monday-Thursday and alternate Fridays 7:00 AM - 4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy V. King can be reached on (571) 272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Roy King/
Supervisory Patent Examiner, Art
Unit 1793

/JR/